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**LabLink**

**Director, Bureau of Laboratories**  
**Sandip Shah, Ph.D., HCLD(ABB)**

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### **Bureau Vision**

The Bureau of Laboratories is a stronger, more diverse team within an integrated public health system. We utilize advanced technology and innovative leadership to provide comprehensive public health services in our dynamic global community.

### **Bureau Mission**

We are dedicated to continuing leadership in providing quality laboratory science for healthier people and communities through partnerships, communication and technical innovation.



Michigan Department of Health & Human Services

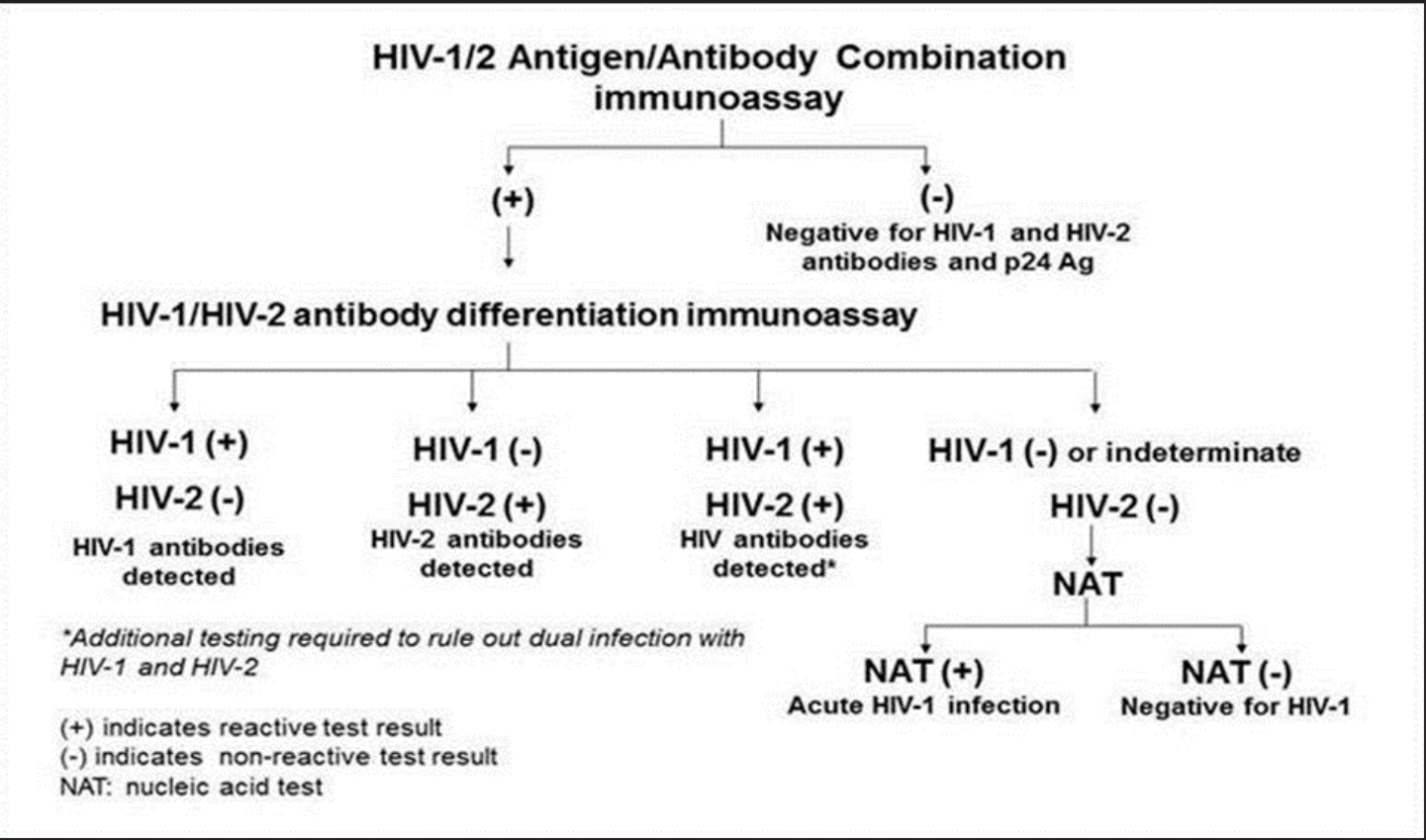
RICK SNYDER, GOVERNOR | NICK LYON, DIRECTOR

# HIV Testing Algorithm Update for MDHHS

Author: Bruce A. Robeson, MT(ASCP) Unit Manager, Viral Isolation and Molecular Testing

Due to the discontinuation of the Bio-Rad Multispot Supplemental Assay in July 2016, the Bio-Rad Geenius™ HIV 1/2 Supplemental Assay will now be part of the MDHHS HIV testing algorithm as the HIV-1/HIV-2 Antibody Differentiation Immunoassay (see table 1 below). The Geenius Assay is a single-use immunochromatographic assay for the confirmation and differentiation of individual antibodies to HIV-1 and HIV-2 in serum or plasma. It is intended for use as an aid in the diagnosis of infection with HIV-1 and/or HIV-2. It will be used as a more specific test to confirm the presence of antibodies to HIV-1 and HIV-2 for specimens found to be repeatedly reactive by screening testing. It can also be used in pediatric patients as young as 2 years of age.

Table 1:



The results of the Geenius™ HIV 1/2 Supplemental Assay are read and interpreted only by the Geenius™ Reader with dedicated software using a proprietary algorithm. Serum or plasma samples collected by standard laboratory procedure may be used in the test.

The following anticoagulants may be used for collecting plasma samples: EDTA, heparin or sodium citrate (SST tubes are acceptable).

For those that currently submit specimens to the MDHHS HIV lab, you will notice that the results may include options that were not previously seen with the Multispot Assay (See the chart below).

Multispot Results		Geenius Results	
Nonreactive		Nonreactive	
Reactive	HIV-1 positive	Reactive	HIV-1 positive
Reactive	HIV-2 positive	Reactive	HIV-2 positive
No Equivalent		Reactive	HIV-2 positive with HIV-1 cross reactivity
Reactive	HIV positive (undifferentiated)	Reactive	HIV positive Untypeable (undifferentiated)
Indeterminate	HIV-1 Indeterminate	Indeterminate	HIV-1 Indeterminate
No Equivalent		Indeterminate	HIV-2 Indeterminate
No Equivalent		Indeterminate	HIV Indeterminate

When additional testing is necessary to confirm results, specimens will be sent for Nucleic Acid Testing (NAT).

**Note:** Since inception of the Centers for Disease Control and Prevention recommended HIV testing algorithm at MDHHS, eleven HIV-1 early or acute HIV infections have been diagnosed.



# MDHHS Hosts “Bring Your Child to Work Day”

**Author: Teresa Miller, Chemical Threat Response Training Coordinator**

The Michigan Department of Health and Human Services (MDHHS) hosted activities statewide for “Bring your Child to Work Day” on Thursday, August 11, 2016. Children of MDHHS employees experienced a glimpse of their parent’s workplace and possibly a look at future career paths.

The Bureau of Laboratories (BOL) offered two of the dozen career booths hosted during this event at the South Grand Building in Lansing. The booths allowed children to interact with areas of MDHHS that may normally be inaccessible to visitors during business hours due to privacy or safety concerns.

Microbiologist, Heather Seymour, piqued the children’s curiosity with facts about Michigan ticks, helping them understand how to prevent illness from the creepy crawlies. Approximately 125 child participants were able to get a close up view of an *Ixodes scapularis*, a.k.a. Black-legged tick, and a *Dermacentor variabilis*, a.k.a. American Dog Tick, utilizing a stereoscope for magnification.

A special “Thank You” to our friends in the Bureau of Epidemiology and Population Health for supplying informational brochures and tick identification cards for the children.



“Elephant toothpaste” was created at the second booth and children were amazed when a simple chemical reaction utilizing hydrogen peroxide and dish soap was boosted by the catalyst potassium iodide. The children were attentive while they witnessed a catalyst in action and were surprised how quickly the chemical mixture produced a huge quantity of bubbly “toothpaste,” which would have been more than enough for an elephant to use. Eleven year old Jason Miller, grandchild of a BOL Laboratory Scientist, donned laboratory personal protective equipment and while under close supervision, executed the laboratory experiment for his peers.

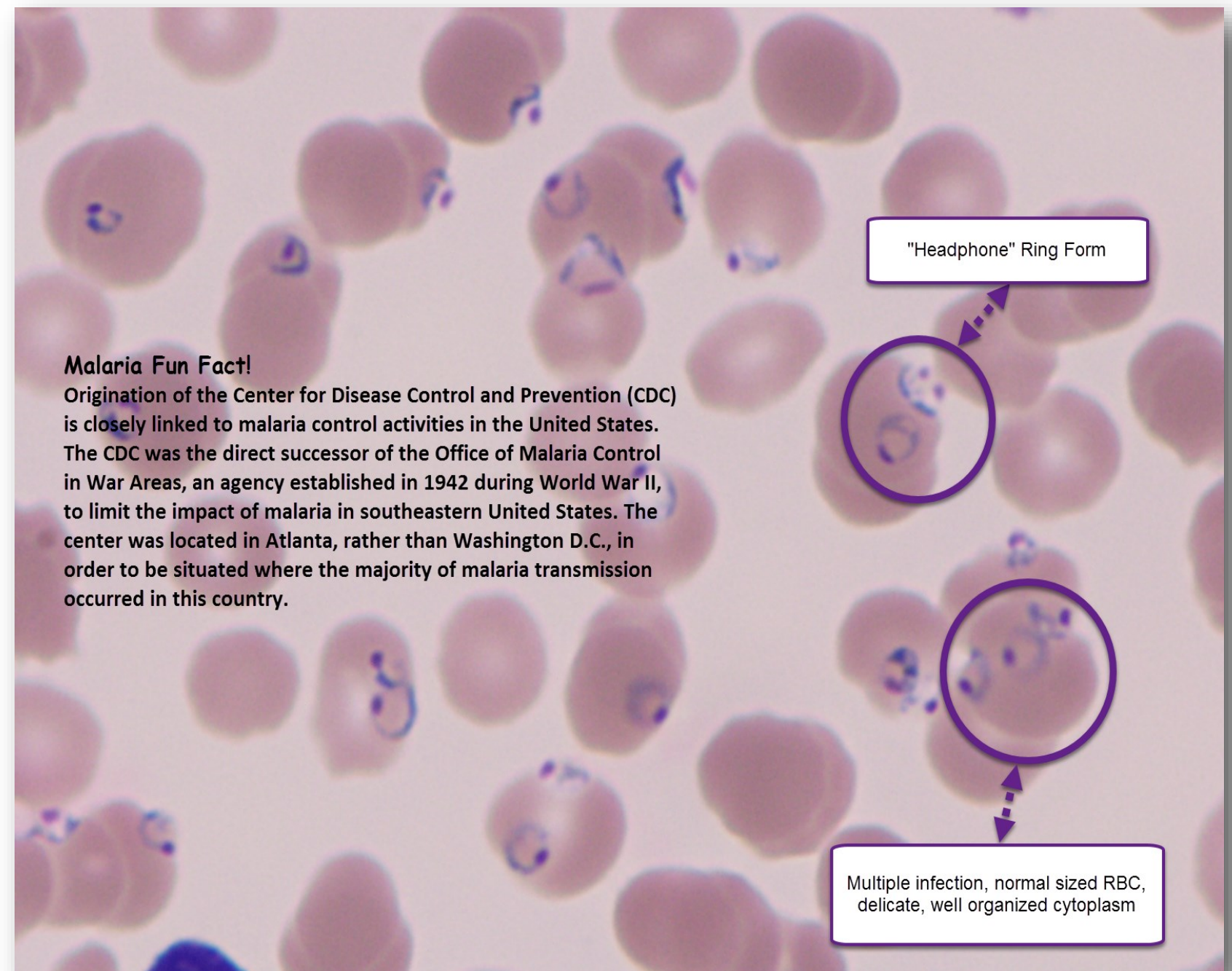


## Malarial Identification and *Plasmodium* PCR

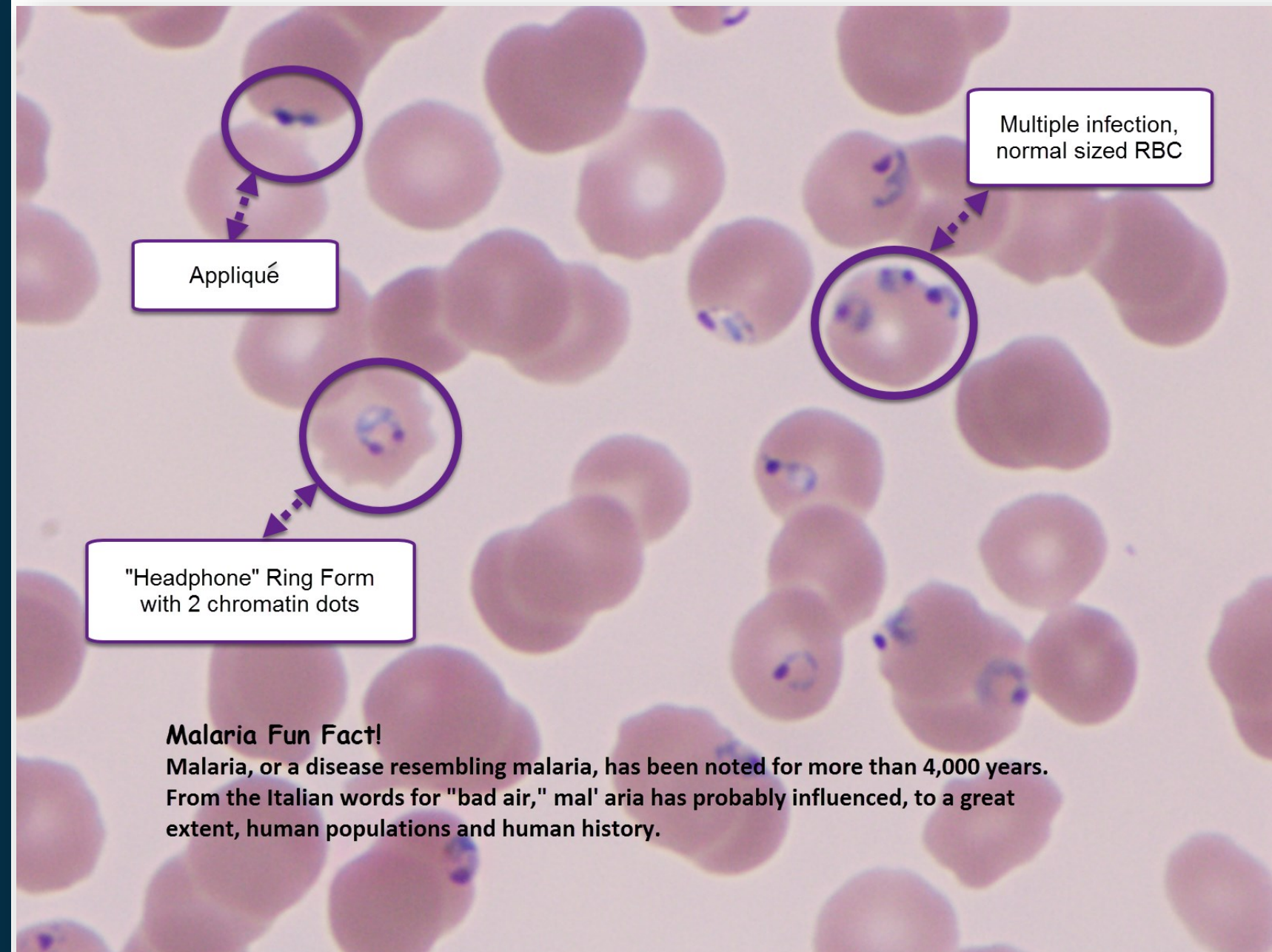
Author: Jason Wholehan, MT(ASCP), Microbiologist

Malarial parasites are microorganisms that belong to the genus *Plasmodium*. There are four species of this bloodborne parasite that infect humans. Traditional identification and speciation of *Plasmodium* sp. is performed microscopically (morphological analysis) using thick and thin blood smears stained with either Giemsa or Wright stain. This continues to be recognized as the “gold standard” identification. However, species identification can be difficult due to the overlap of some distinguishing characteristics between species and technologist inexperience; especially here in snowy, malaria-free Michigan. The parasitology section at the Michigan Department of Health and Human Services Bureau of Laboratories (MDHHS BOL) has been utilizing a polymerase chain reaction (PCR) method for the identification of *Plasmodium* sp. for several years now. PCR identification can be a sensitive complement to stained slides especially when parasitemia is low or when organism identification is in doubt.

Recently, MDHHS BOL received an interesting specimen for *Plasmodium* speciation. The patient history included travel abroad to a malaria endemic area while not taking preventive anti-malaria medication. The results can be seen in the photos accompanying this article. Even though there is no firm definition of hyperparasitemia, concentrations above 5% and 10% are commonly used. This patient’s parasitemia was unusually and alarmingly high at 28%. After reviewing the slides, the parasitologists were fairly certain of the identification, but PCR was performed as a confirmation. The PCR result was *Plasmodium falciparum* DNA Detected.



continued on Page 5



This case demonstrated several classic *P. falciparum* characteristics such as normal size of infected RBCs, multiple ring forms infecting a single RBC, delicate and well organized cytoplasm of ring form parasites, two chromatin dots (headphone ring forms), and appliqué forms (rings adhering to RBC cell membrane periphery).

This case also presented with some unusual characteristics more commonly seen in the blood parasite *Babesia*, such as extra cellular ring forms and hyperparasitema. In this case, MDHHS BOL used the PCR method to rule out *Babesia* and confirm *P. falciparum*.

If you wish to submit a specimen to MDHHS for *Plasmodium sp.* identification, please prepare and send thick and thin blood smears stained with either Giemsa or Wright stain along with a **minimum** volume of 1ml of whole blood collected in EDTA anticoagulant as required for the PCR method. Blood smears must accompany all EDTA blood submitted for suspect *Plasmodium sp.* EDTA blood may be shipped at room temperature or on cold (4°C) packs overnight. The time frame to collect blood specimens for *Plasmodium sp.* examination should be midway between the paroxysms of chills and fever.



# MDHHS BOL Offers Free Packaging and Shipping Classes

Author: Shannon Sharp, MT(ASCP), Bioterrorism Training Coordinator

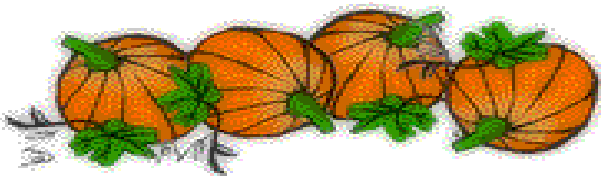
This fall, the Michigan Department of Health and Human Services is offering free Packaging and Shipping classes. The Packaging and Shipping course will provide a comprehensive overview of Federal (DOT & USPS), and International (IATA) Regulations applicable to the packaging and shipping of laboratory specimens. The course offers an understanding of the terminology, packaging, marking, labeling and documentation required under these regulations. Successful completion of this course will meet requirements for employer certification. This course is designed to meet the needs of those previously certified as well as those who have never completed certification.

The first two hours will be a combined training for those who have never been previously certified and a refresher course for those renewing their certification. Those who have never been certified will stay for an additional 2 hours of training for an in-depth discussion, hands-on exercises, and a question and answer period.

If you are interested in attending any of the sessions listed in the adjacent table, please register at the MI-TRAIN website: <https://mi.train.org>

The course name is Packaging and Shipping of Clinical Samples and the course identification number is 1062236.

For questions contact Shannon Sharp at (517) 335-9653 or [sharps1@michigan.gov](mailto:sharps1@michigan.gov)



Facility Name	Address	Date	Time
<b>Spectrum Health Regional Laboratory MC 056</b>  Room: Conference Room (7 <sup>th</sup> floor)	35 Michigan St. NE Grand Rapids, MI 49503	10/4/2016	<b>9:30am-1:30pm</b> (Recertification only 9:30am-11:30am)
<b>Spectrum Health Big Rapids</b>  Room: ACR2	605 Oak Street Big Rapids, MI 49307	10/10/2016	<b>10am-2pm</b> (Recertification only 10am-noon)
<b>University of Michigan Health System</b>  Room: 2G209	1500 E. Medical Center Dr. Ann Arbor, MI 48109	10/19/2016	<b>9:30am-1:30pm</b> (Recertification only 9:30am-11:30am)
<b>MDHHS Bureau of Laboratories</b>  Room: 282 (2 <sup>nd</sup> Floor)	3350 N. Martin Luther King Jr. Blvd. Lansing Michigan 48909	11/17/2016	<b>Recertification only</b> 10am-Noon
<b>MDHHS Bureau of Laboratories</b>  Room: 282 (2 <sup>nd</sup> Floor)	3350 N. Martin Luther King Jr. Blvd. Lansing Michigan 48909	11/17/2016	<b>1pm-5pm</b> (Recertification only 1pm-3pm)
<b>MDHHS Bureau of Laboratories</b>  Room: 282 (2 <sup>nd</sup> Floor)	3350 N. Martin Luther King Jr. Blvd. Lansing Michigan 48909	12/07/2016	<b>10:30am-2:30pm</b> (Recertification only 10:30am-12:30pm)



# Assuring Quality in the Pre-Examination Phase of Laboratory Testing

Author: Martha Boehme, Quality Assurance Section Manager

We rely heavily on our submitters to properly collect and process the specimens destined for our laboratory. You can help assure the quality of the test results you receive from us by observing these tips:

## CHECK THE SPECIMEN REQUIREMENTS

We have two electronic resources to help you. Our [A to Z Test Listing](#) contains complete information about all of our laboratory testing, from collection to results reporting. The [Specimen Collection Instructions](#) are shorter one-page guides to proper specimen collection and handling.

## LABEL THE SPECIMEN WITH TWO UNIQUE IDENTIFIERS



Laboratory accreditation requires that every specimen be labeled with two unique identifiers. The complete patient name is one. The second one can be date of birth, medical record number, or your internal specimen number.

Doe, Jane    DOB: 01-01-1900  
Specimen ID: 12456  
Medical Record Number XXXX1111  
Date: 01-01-1921    Time: 1201  
Collector: Phoebe Phlebotomist

## USE THE CURRENT TEST REQUEST FORM

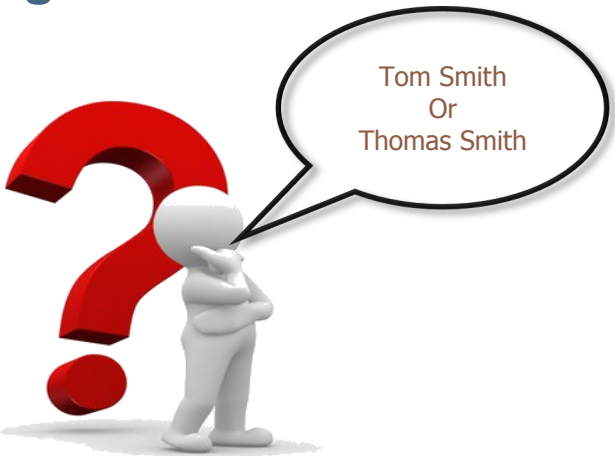
Our request forms change frequently, when we change or add new tests. Sometimes we need more information from you to comply with changes in the public health code. Please download the correct test requisition from our webpage [here](#). Check at least once a year to make sure you are using the most current version.

### Instructions for Specimen Submission

Michigan Department of Health and Human Services-Bureau of Laboratories

Please follow these instructions when submitting specimens.  
Must be sent on cool packs (4°C)

DCH-XXXXX - 09.2016



## WRITE LEGIBLY

The request form must match the specimen label. As part of good specimen collection practice, train your staff to verify the correct full name of every patient every time. Ask the patient to spell their first and last name, avoiding use of nicknames. Our policy does not allow us to assume that Tom Smith and Thomas Smith are the same person!

## PACKAGE SPECIMENS PROPERLY

Safety first! The transportation regulations are designed to protect everyone during transport. Take a few extra seconds to tighten screw-caps, and secure them with tape or para-film. Make sure you include enough absorbent material. Leaking specimens endanger couriers, postal workers, our receiving staff, and other patient specimens.



## ORDER ONLY WHAT YOU NEED

Did you know you can request the packaging components you need without ordering the whole kit? For example, if you submit multiple serum specimens in one package, you can order extra screw-cap pour-off tubes. Use the back of the [Shipping Units Requisition Form](#).

For questions contact: [boehmem@michigan.gov](mailto:boehmem@michigan.gov)

## Influenza Season at the Bureau of Laboratories

Author: Kevin Rodeman, Microbiologist, Virology Section

Influenza (flu) is a contagious respiratory illness caused by influenza viruses. It can cause mild to severe illness. Serious outcomes of flu infection can result in hospitalization and even death. Some people, such as older patients, young children, and those with certain health conditions, are at high risk for serious flu complications. The best way to prevent the flu is by getting **vaccinated** each year. The Virology Section at the Michigan Department of Health and Human Services Bureau of Laboratories (MDHHS BOL) perform tests developed by the Centers for Disease Control and Prevention (CDC) which helps track the spread of influenza throughout the state. In addition, influenza tracking aids local hospitals with diagnosis, identification of possible antiviral drug resistance, and attempts to determine other respiratory illness in samples testing negative for influenza.

MDHHS BOL as well as other state and local health departments work in conjunction with the CDC to make recommendations for the current year's influenza vaccine. This surveillance is done by subtyping Influenza A and B specimens sent to the laboratory by Sentinel Physicians as well as Sentinel Hospitals participating in the past year's influenza testing. Subtyping kits, supplied by CDC, can discriminate between Influenza: seasonal A/H1, seasonal A/H3, A/H3 variant, A (H1N1)pdm09, and Influenza B lineage Victoria and Yamagata, as well as novel influenza strains. Additionally, any specimen tested with indeterminate results for flu by polymerase chain reaction (PCR) that have been received from local hospitals and healthcare facilities, can be subject to repeat testing using the CDC assay to help with the diagnosis. Data generated is summarized weekly in the Michigan Flu Focus (MIFF) report sent out by MIHAN. This information is shared with the CDC and is reported nationally in the weekly influenza surveillance report, FluView, published and available for viewing on the CDC website.

MDHHS BOL partners with the Bureau of Epidemiology and Population Health on surveillance in conjunction with Sentinel Provider Surveillance and the CDC Influenza Hospitalization Surveillance Project, to provide population-based rates of hospitalization due to severe influenza illness including both active surveillance and chart review of lab-confirmed cases. The virology laboratory also assists in the investigation of outbreaks in congregate settings to determine etiology.

Antiviral resistance means that a virus has changed in such a way that antiviral drugs are less effective or not effective at all in treating or preventing illnesses with that virus. Influenza viruses can rapidly become resistant to antiviral drugs. Using next generation sequencing technology, the Virology Section detects nucleotide changes (resulting in amino acid sequence changes) in Influenza A/H3 and A/H1 strains. This indicates if the strains are resistant to the three FDA-approved neuraminidase inhibitor antiviral drugs recommended by CDC this season: oseltamivir (Tamiflu®), zanamivir (Relenza®), and peramivir (Rapivab®). The surveillance component or antiviral resistance test looks for mutations in both Influenza A/H3 and A/H1 with results reported to CDC. The BOL clinical assay is performed upon physician request when a patient fails to respond to antiviral treatment. The markers for the clinical assay are H275Y and I223R. The rate of resistance last year was 2 in 96 specimens tested.

To better characterize respiratory illness circulating in the state, all nasopharyngeal specimens testing negative for influenza A and B, are put into viral culture. If growth is detected, the isolate is tested using direct fluorescent antibodies specific for Adenovirus, Respiratory Syncytial Virus, Human Parainfluenza 1, 2, and 3, plus Influenza A and B. Numbers and types of detected respiratory viruses are added to the weekly MIFF and FluView publication to give a better picture of the circulating strains of respiratory illness in the State of Michigan.



# Immune Status Testing for Nursing Students, Medical Students and Public Health Employees

Author: Martha Boehme, Quality Assurance Section Manager

MDHHS Bureau of Laboratories currently charges for Immune Status testing. Submitters pay for the testing up front by ordering pre-paid requisition forms DCH-0459, each of which costs \$26.00 and has a unique accounting control number printed in red.

In 2017, we expect to have an online ordering and payment system in place, but until then, please place your order for DCH-0459, Immune Status Testing, forms by calling 517-284-9372.

Please order the number of forms you will need, as copies will **not** be accepted by the laboratory. We also supply serum tubes and packaging materials with your order.

Please email questions to: [boehmem@michigan.gov](mailto:boehmem@michigan.gov)



**MEDICAL/NURSING STUDENT ANTIBODY TESTING**  
Michigan Department of Health and Human Services  
Bureau of Laboratories  
3350 N. Martin Luther King Jr. Blvd.  
P.O. Box 30035  
Lansing, Michigan 48909  
[HTTP://www.michigan.gov/mdhhs/lab](http://www.michigan.gov/mdhhs/lab)  
Phone (517) 335 – 8059 - Laboratory Records   Fax (517) 335 – 9871   Technical Information (517) 335 – 8067

Date Received at MDHHS		MDHHS Sample #	
Return Results To:		ENTER STARLIMS CODE IF KNOWN	
		Phone (247)	
		FAX	
REFERRING PHYSICIAN/ PROVIDER NAME			
SUBMITTER'S SPECIMEN NUMBER (If Applicable)		REQUIRED SPECIMEN SOURCE IS SERUM	
CHECK TESTS REQUESTED		<input type="checkbox"/>	
<input type="checkbox"/> All <input type="checkbox"/> Measles <input type="checkbox"/> Mumps <input type="checkbox"/> Rubella <input type="checkbox"/> Anti- <b>HBsAg</b> <input type="checkbox"/> Varicella <input type="checkbox"/> Zoster		<b>ACCOUNTING CONTROL NUMBER</b> <b>2701</b>	
DATE OF COLLECTION			
PATIENT'S NAME (Last, First, M.I.)			
SUBMITTER'S PATIENT NUMBER			
PATIENT'S CITY OF RESIDENCE			
GENDER	<input type="checkbox"/> FEMALE <input type="checkbox"/> MALE	PREGNANT? (IF STATUS IS KNOWN) <input type="checkbox"/> YES <input type="checkbox"/> NO	
DATE OF BIRTH			

DCH-0459 August 1, 2016   By Authority of Act 265, P.A. 1978

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LabLink is published quarterly by the Michigan Department of Health and Human Services, Bureau of Laboratories, to provide laboratory information to Michigan health professionals and public health community.

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Editor: Teresa Miller , BSc, Laboratory Scientist